

COATING, MODIFICATION AND ETCHING OF SUBSTRATE SURFACE  
WITH PARTICLE BEAM IRRADIATION OF THE SAME

ABSTRACT OF THE INVENTION

There is provided a method of applying a surface  
5 treatment, such as coating, denaturation, modification and  
etching, to a surface of a substrate. The method comprises  
the steps of bringing a surface treatment gas into contact  
with a surface of a substrate, and irradiating the surface  
of the substrate with a fast particle beam to enhance an  
10 activity of the surface and/or the surface treatment gas  
thereby facilitating the reaction between the surface and  
the gas. The fast particle beam may be selected from a  
group consisting of an electron beam, a charged particle  
beam, an atomic beam and molecular beam. For example, in a  
15 coating operation, chemically deposition of predetermined  
component elements of the gas onto the surface is effected  
and a predetermined portion in the surface of the substrate  
is irradiated with a particle beam to form a coating layer  
on the predetermined portion.

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